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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/262,000	03/05/1999	SIK ON KONG	CS98-076	8744

7590

06/20/2002

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EXAMINER

VOCKRODT, JEFF B

ART UNIT PAPER NUMBER

2822

DATE MAILED: 06/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/262,000

Applicant(s)

KONG ET AL.

Examiner

Jeff Vockrodt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-12 is/are rejected.
- 7) ☐ Claim(s) 13-32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

This office action is in response to the amendment filed February 7, 2002. Claims 8-32 are pending. The finality of the last office action and indicated allowability of claims 8-32 is withdrawn in view of the newly discovered U.S. Pat. No. 6,124,912 ("Moore"). Rejections based on the newly cited reference(s) follow.

Claim Objections

Claim 8 is objected to because of the following informalities:

"the said silicon oxide" lacks antecedent basis in the claim. Appropriate correction is required.

The examiner invites applicant to replace instances of "the said" in the claims with either "said" or "the" to put the claims in better form.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,027,999 ("Wong") in view of U.S. Pat. No. 6,124,912 ("Moore").

Wong teaches a method of forming a reflective LCD that positions a LCD standoff on a passivation layer that covers the reflective surface comprising the steps of:

providing a silicon wafer 10 having a pattern of active device structures therein and thereon;

forming a first metallic layer 20 over the said silicon oxide 18 (this limitation lacks antecedent basis);

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forming a second metallic layer 32 over the said silicon oxide 24, which is used both for connections 32 and for bonding pads 30;

forming a silicon oxide insulation 36 over the said second metal layer 32;

forming a third metallic layer 42 over the surface of said layer of silicon dioxide 36;

forming a photoresist mask (not shown) over the said third metallic layer 42 having a covering over the planned pixel locations 42 of the said liquid-crystal-on-silicon display device;

removing the said third metallic layer not covered by the said photoresist mask (not shown);

removing the said photoresist (not shown) mask to provide that each said pixel retains said metallic layer 42, which shall act as a mirror reflector for the light incident upon said liquid-crystal-on-silicon display device; and

depositing a passivation layer on the pixels 42.

Wong differs from the claimed invention by not teaching depositing optical interference layers of silicon oxide/silicon nitride/silicon oxide/silicon nitride over said third metallic layer 42 and said silicon dioxide layer 36.

Moore teaches an improvement on reflective LCDs that have a passivation layer above a reflective pixel layer wherein the passivation layer is replaced with a layer of silicon oxide 233 /silicon nitride 232 /silicon oxide 231 /silicon nitride 230 over the reflector and the oxide layer that underlies the reflector. This quarter wave stack having four dielectric layers creates constructive interference which increases the reflectance of the pixel. Moore, col. 3, ll. 32-42.

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the passivation layer of Wong with the quarter wave stack of Moore to increase the reflectance of the pixel as taught by Moore.

Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong and Moore as applied to claim 8 above, further in view of U.S. Pat. No. 5,831,710 ("Colgan").

Wong and Moore do not teach the method of forming the oxide post using silicon oxide by wet etching.

Colgan teaches a method of forming alignment post on a LCD device by forming an oxide 44 on a thin etch stop layer 43 and performing a pattern etch back of the oxide to form oxide posts 24 using a wet etchant. Colgan teaches that the thickness of the oxide 44 can set the gap between the cover and the electrodes. Colgan, col. 2, ll. 35-50. The gap is set to approximately 2.5 microns. Colgan, col. 6, ll. 1-2.

It would have been obvious to one of ordinary skill in the art at the time of the invention to form an alignment post by deposition of oxide and a patterned etchback above the quarter wave stack of Moore and Wong because it was known that the gap between the reflective layer and the cover can be controlled in this way as taught by Colgan.

Allowable Subject Matter

Claims 13-32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 13-32 require, in addition to the limitations of claim 8, a combination of material and process for forming alignment posts which are not taught in the references of record. Claims 13-16 additionally requires forming alignment post using amorphous silicon by plasma etching. Claims 17-23 additionally require forming alignment posts using silicon nitride by plug filling. Claims 24-28 additionally require forming alignment posts using insulation material by lift off. Claims 29-32 additionally require forming alignment posts using polyimide by

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photosensitive etching. Neither Wong, Moore, nor Colgan, taken alone or in combination, teach all of the limitations of any of claims 13-32. For the foregoing reasons, claims 13-32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Vockrodt whose telephone number is (703) 306- 9144. The examiner can normally be reached on Monday through Friday, from 8:30 Am to 5:00 Pm EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached on (703) 308-4940. The fax phone number for this Group is (703) 305-3432 or (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

June 14, 2002

J. Vockrodt




CARL WHITEHEAD, JR.
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